

**CLAIMS**

1. A method of fabricating a thin layer, in which a weak buried region is created by implanting a chemical species in a substrate (1) in order thereafter to be able to initiate a fracture of said substrate (1) along said weak region in order to detach said thin layer (6) therefrom, said method being characterized in that it includes the following steps:

a) a "main" implantation of a "main" chemical species (4) in the substrate (1) at a "main" depth (5), and

b) at least one "secondary" implantation of at least one "secondary" chemical species (2) less effective than the main species (4) at weakening the substrate (1), in the substrate (1) at a "secondary" depth (3) different from said main depth (5) and at a concentration higher than the concentration of the main species (4),

wherein said steps a) and b) can be executed in either order, and in that it further includes the following steps:

c) migration of at least a portion of said secondary species (2) up to the neighborhood of the main depth (5), and

d) initiation of said fracture along the main depth (5).

2. A fabrication method according to claim 1, characterized in that said secondary depth (3) is greater than said main depth (5).

3. A fabrication method according to claim 1, characterized in that said secondary depth (3) is less than said main depth (5).

4. A fabrication method according to claim 2 or claim 3, characterized in that said at least one secondary implantation is carried out before said main implantation.

5. A fabrication method according to any one of claims 1 to 4, characterized in that said step c) is encouraged by appropriate heat treatment.

6. A fabrication method according to any one of claims 1 to 5, characterized in that said step d) is carried out with the aid of an appropriate heat treatment.

7. A fabrication method according to claim 5 and claim 6, characterized in that steps c) and d) are carried out during the same heat treatment.

8. A fabrication method according to any one of claims 5 to 7,

characterized in that said heat treatment is carried out within a thermal budget lower than that which would be necessary to initiate said fracture in the absence of steps b) and c).

5 9. A fabrication method according to any one of claims 5 to 7, characterized in that a predetermined thermal budget is complied with, if necessary by implanting more of the secondary species (2) than would be necessary to be able to initiate said fracture with a thermal budget higher than said predetermined thermal budget.

10 10. A fabrication method according to any one of claims 5 to 9, characterized in that said heat treatment comprises heating in a furnace and/or local heating and/or laser heating.

11. A fabrication method according to any one of the preceding claims, characterized in that said step d) includes the application of mechanical stresses.

15 12. A fabrication method according to claim 11, characterized in that said mechanical stresses comprise the use of a jet of fluid and/or the insertion of a blade into the implanted region and/or the application of traction, shear or bending stresses to the substrate (1) and/or acoustic waves.

20 13. A fabrication method according to any one of claims 1 to 12, characterized in that, before or during step d), a thickener is applied to the substrate (1) to serve as a support for said thin layer (6) after its separation from the substrate (1).

25 14. A fabrication method according to any one of claims 1 to 12, characterized in that, before or during step d), a "handle" support is applied to the substrate (1), after which the thin layer (6) is transferred onto a final support.

15. A fabrication method according to any one of the preceding claims, characterized in that the main chemical species (4) consists of hydrogen ions or atoms.

30 16. A fabrication method according to any one of the preceding claims, characterized in that the secondary chemical species (2) comprise(s) ions or atoms of at least one rare gas.

17. A thin layer (6), characterized in that it has been fabricated by a method according to any one of claims 1 to 16.

35 18. A thin layer (6) according to claim 17, characterized in that it has

been transferred onto a flexible or rigid support.